

Common misconceptions about insulin therapy in diabetic patients of a tertiary care hospital of Peshawar

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ABSTRACT

Introduction: Patients of Diabetes Mellitus (DM), a serious metabolic disorder caused by relative or absolute availability of insulin, may harbor misconceptions about Insulin therapy that may affect their level of control of the disease.

Objectives: To determine the common misconceptions about insulin therapy in diabetic patients, and relate the level of education to the misconceptions.

Materials & Methods: A cross-sectional observational study was conducted at Rehman Medical Institute (RMI), Peshawar from January 1st, 2019 to April 1st, 2019. Data were collected on a predesigned structured questionnaire containing two parts, demographics and questions related to insulin misconceptions. The project was approved by the Department of Medical Research and Student Research Society of Rehman Medical College (RMC). Data were analyzed using SPSS version 23.0. Frequencies, percentages and relationship between different variables was determined. The Chi-square test was used for comparison of independent variables keeping $p \leq 0.05$ as significant.

Results: A total of 210 patients participated in the study which included 93(44.3%) males and 117(55.7%) females, of ages 15 - 98 years, the mean age being 52.20 ± 14.03 years. Most of the patients (75.2%) agreed that insulin was the last option in treatment, commencing insulin means last stage of treatment (66.2%), and insulin injections are costly (53.3%). Most of the individuals disagreed with facts 4 through 17 that were related to daily life activities, short-term use cure, weight gain and its effectiveness. The level of education was not a factor in determining the responses.

Conclusion: Diabetic patients were generally well informed with only a few misconceptions about insulin therapy.

Keywords: Insulin; Weight Gain; Diabetes Mellitus; Metabolic Diseases.

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INTRODUCTION

Diabetes mellitus (DM) is a serious metabolic disorder in which there is an abnormal increase in blood glucose level due to defective production of insulin, its action, or both. It is increasingly common with cases rising from 108 million in 1980 to 422 million in 2014.¹ WHO predicted that diabetes mellitus will be the 7th leading cause of death in 2030.² Diabetes is also increasing the worldwide healthcare cost and economic burden.³ According to an article, 11.77% of Pakistani population suffers from diabetes in which the prevalence of males was 11.20% and females 9.19%. In Pakistan, the prevalence of type II DM in people >25 years was 8.6% in Balochistan and 13.9% in Sindh.⁴ Diabetes is one of the 5 reasons of non-communicable diseases in Pakistan.⁵

Diabetes can be avoided by adopting certain healthy lifestyle changes, a check on weight, mental stability and dietary changes. Patients of DM are treated with oral hypoglycaemic drugs and/or insulin therapy.⁶ Insulin is the drug of choice for Type I DM patients and patients of Type II DM in their late progressive stages.⁷ Patients usually try delaying and avoid taking insulin therapy which can potentially increase complications later in life.⁸ Psychological barriers to insulin intake relate to fears of hypoglycemia, stigmatization, fear of injections, and self-testing.⁹ They also think it is related with a more serious degree of disease, which they refuse to admit.¹⁰ Physicians and health care providers prescribe oral anti diabetic drugs instead of insulin because they assign importance to the patients' misconceptions and comfort rather than their proper treatment.⁹ People around the world have been using medicinal plants to treat diabetes because it has hypoglycaemic properties with other beneficial effects but no side effects.¹¹

Insulin is not preferred by physicians and diabetic patients as a start-up therapy or replacement with oral antidiabetic drugs because of different reasons.¹² A study from India concludes that patients avoid taking insulin because of the fear of pain, injections, addiction, hypoglycaemic symptoms, storage issues, expensive, a belief that the previous medications have failed.¹³

Some of them associate insulin therapy with very serious diseases for example blindness, renal failure, amputations strokes, or early death.¹⁴

The psychological opposition towards insulin use in both diabetics and their physicians is termed as Psychological Insulin Resistance (PIR).¹⁵ It was studied that people who received tertiary level education were more willing to use insulin.¹⁶ In Pakistan, studies show that 25% people would risk their life but not use insulin in any circumstance. Young women, especially girls and their families, refuse insulin in fear that it may adversely affect their marriage proposals. Many Muslims think insulin injections will negatively influence their religious obligations like prayers and fasting etc.¹⁷ On the other hand, physicians do not promote insulin usage because of their concerns like inadequate time and personnel, patient's unusual reaction like abandoning the therapy or not being satisfied with the results, and the concern about the potential symptoms like hypoglycaemia and weight gain.

However, early insulin use at diagnosis have beneficial effects like improved glycaemic control, reduced body weight, decrease in microvascular and macrovascular damage and it can also improve the function of remaining beta cells.¹⁸

This study determines the misconceptions that are prevalent in diabetics regarding insulin therapy and how the level of education affects perception of these fallacies.

MATERIALS & METHODS

This was a cross-sectional observational study conducted at Rehman Medical Institute (RMI), Peshawar from January 1, 2019 to April 1, 2019. The project was approved by the Department of Medical Research, Rehman Medical College. Diabetic patients older than age 15 years visiting the hospital were interviewed after informed consent through convenience sampling; patients who had underlying neurologic or psychiatric diseases were excluded. Data were collected on a structured questionnaire containing two parts, one for demographics and the other for questions related to insulin misconceptions. eventeen questions on the most common misconceptions were included in the second

part. A sample size of 210 was calculated using WHO sample size calculator.

Data were entered into and analyzed by Statistical Package for Social Sciences (SPSS) version 23.0. Frequencies, percentages, and relationship between different variables were determined. The Chi-square test was used for comparison of independent variables keeping $p \leq 0.05$ as significant.

RESULTS

A total of 210 patients participated in the study which included males (93, 44.3%) and females (117, 55.7%), their ages ranging from 15 to 98 years (mean age 52.20 ± 14.03 years). The average time since diagnosis of DM was 9.05 ± 9.09 years and majority of the participants were type II diabetics (90.0%). Table 1 shows the demographics.

Table 1: Demographic details of diabetic patients (n=120).

Demographics		Values
Age in years (Mean \pm SD)		52.20 \pm 14.03
Years since DM diagnosis (Mean \pm SD)		9.05 \pm 9.09
Education Level n (%)	Illiterate	64 (30.5)
	Undergraduate	97 (46.2)
	Graduate	49 (23.3)
Gender n (%)	Male	93 (44.3)
	Female	117 (55.7)
Diabetes Type n (%)	Type I	21 (10.0)
	Type II	189 (90.0)

Table 2 shows the perspective of diabetic patients on Insulin therapy. Most patients agreed that insulin was the last option in treatment (75.2%), commencing insulin means last stage of treatment (66.2%), and insulin injections are costly (53.3%). Many patients disagreed that insulin lowers glucose to dangerous levels (53.3%). Similarly, participants disagreed that insulin therapy leads to renal failure (68.6%), causes scarring (51.0%) or blindness (68.1%), restricts daily life activities (65.2%), fails to control blood glucose (78.1%), or is a source of social embarrassment (77.6%). Though most disagreed (47.1%) that anti-diabetic and insulin therapy are the same, there were individuals that thought they were the same (34.8%) Most of the individuals rightly disagreed with facts 12 to 17.

Table 2: Perspective of Diabetics on Insulin Therapy (n=120).

#	Questions about Insulin Facts & Fallacies	Disagree n (%)	Neutral n (%)	Agree n (%)
1.	Insulin is the last treatment for diabetes	31 (14.8)	21 (10.0)	158 (75.2)
2.	Insulin commencement indicates serious stage of diabetes	32 (15.2)	39 (18.6)	139 (66.2)
3.	Insulin injection is costly	69 (32.9)	29 (13.8)	112 (53.3)
4.	Insulin lowers blood sugar level to dangerous levels	112 (53.3)	45 (21.4)	53 (25.2)
5.	Insulin therapy leads to renal failure in diabetics	144 (68.6)	32 (15.2)	34 (16.2)
6.	Insulin injection leads to scarring at its site	107 (51.0)	48 (22.9)	55 (26.2)
7.	Insulin therapy leads to blindness in diabetics	143 (68.1)	46 (21.9)	21 (10.0)
8.	Insulin usage restricts daily life activities	137 (65.2)	32 (15.2)	41 (19.5)
9.	Insulin fails to control blood sugar	164 (78.1)	25 (11.9)	21(10.0)
10.	Insulin therapy is a source of social embarrassment	163 (77.6)	29 (13.8)	18 (8.6)
11.	Anti-diabetic and Insulin are two forms of the same treatment	99 (47.1)	38 (18.1)	73 (34.8)
12.	Insulin injection causes weight gain	114 (54.3)	48 (22.9)	48 (22.9)
13.	Insulin injection is addictive	167 (79.5)	25 (11.9)	18 (8.6)
14.	Insulin misleads people of having a contagious disease	153 (72.9)	36 (17.1)	21 (10.0)
15.	As long as insulin is taken regularly, diet restriction is not needed	163 (77.6)	25 (11.9)	22 (10.5)
16.	Short term use of Insulin cures diabetes	171 (81.4)	24 (11.4)	15 (7.1)
17.	Insulin treatment should be stopped well in advance when checking blood sugar level	100 (47.6)	82 (39.0)	28 (13.3)

Comparing the education levels with the common misconceptions, it was found that there was only a significant difference in the misconceptions for two facts, insulin being the last treatment ($p=0.038$) and insulin therapy being a social

embarrassment ($p=0.020$). All the other facts did not see a significant difference in their perspective towards insulin therapy ($p>0.05$). Table 3 shows the results.

Table 3: Perspective of Insulin therapy based on level of education of diabetic patients (n=120).

#	Questions	Illiterate (n=64)			Undergraduate (n=97)			Postgraduate (n=49)			p value
		DA n (%)	N n (%)	A n (%)	DA n (%)	N n (%)	A n (%)	DA n (%)	N n (%)	A n (%)	
1.	Insulin is the last treatment for diabetes	7 (10.9)	2 (3.1)	55 (85.9)	13 (13.4)	11 (11.3)	73 (75.3)	11 (22.4)	8 (16.3)	30 (61.2)	0.038
2.	Insulin commencement indicates serious stage of diabetes	6 (9.4)	11 (17.2)	47 (73.4)	17 (17.5)	17 (17.5)	63 (64.9)	9 (18.4)	11 (22.4)	29 (59.2)	0.477
3.	Insulin injection is costly	18 (28.1)	6 (9.4)	40 (62.5)	32 (33.0)	15 (15.5)	50 (51.5)	19 (38.8)	8 (16.3)	22 (44.9)	0.405
4.	Insulin lowers blood sugar level to dangerous levels	41 (64.1)	7 (10.9)	16 (25.0)	46 (47.4)	27 (27.8)	24 (24.7)	25 (51.0)	11 (22.4)	13 (26.5)	0.122
5.	Insulin therapy leads to renal failure in diabetics	52 (81.3)	5 (7.8)	7 (10.9)	58 (59.8)	20 (20.6)	19 (19.6)	34 (69.4)	7 (14.3)	8 (16.3)	0.073
6.	Insulin injection leads to scarring at its site	34 (53.1)	11 (17.2)	19 (29.7)	49 (50.5)	24 (24.7)	24 (24.7)	24 (49.0)	13 (26.5)	12 (24.5)	0.759
7.	Insulin therapy leads to blindness in diabetics	43 (67.2)	14 (21.9)	7 (10.9)	63 (64.9)	25 (25.8)	9 (9.3)	37 (75.5)	7 (14.3)	5 (10.2)	0.624
8.	Insulin usage restricts daily life activities	38 (59.4)	10 (15.6)	16 (25.0)	62 (63.9)	16 (16.5)	19 (19.6)	37 (75.5)	6 (12.2)	6 (12.2)	0.425
9.	Insulin fails to control blood sugar	49 (76.6)	6 (9.4)	9 (14.1)	75 (77.3)	12 (12.4)	10 (10.3)	40 (62.5)	7 (14.3)	2 (4.1)	0.481
10.	Insulin therapy is a source of social embarrassment	50 (78.1)	7 (10.9)	7 (10.9)	69 (71.1)	21 (21.6)	7 (7.2)	44 (89.8)	1 (2.0)	4 (8.2)	0.020
11.	Anti-diabetic and Insulin are two forms of the same treatment	35 (54.7)	11 (17.2)	18 (28.1)	40 (41.2)	17 (17.5)	40 (41.2)	24 (49.0)	10 (20.4)	15 (30.6)	0.414
12.	Insulin injection causes weight gain	41 (64.1)	10 (15.6)	13 (20.3)	48 (49.5)	26 (26.8)	23 (23.7)	25 (51.0)	12 (24.5)	12 (24.5)	0.394
13.	Insulin injection is addictive	52 (81.3)	5 (7.8)	7 (10.9)	72 (74.2)	17 (17.5)	8 (8.2)	43 (87.8)	3 (6.1)	3 (6.1)	0.171
14.	Insulin misleads people of having a contagious disease	49 (76.6)	9 (14.1)	6 (9.4)	65 (67.0)	18 (18.6)	14 (14.4)	39 (79.6)	9 (18.4)	1 (2.0)	0.169
15.	As long as insulin is taken regularly, diet restriction is not needed	50 (78.1)	8 (12.5)	6 (9.4)	73 (75.3)	13 (13.4)	11 (11.3)	40 (81.6)	4 (8.2)	5 (10.2)	0.895
16.	Short term use of Insulin cures diabetes	53 (82.8)	4 (6.3)	7 (10.9)	75 (77.3)	14 (14.4)	8 (8.2)	43 (87.8)	6 (12.2)	0 (0.0)	0.103
17.	Insulin treatment should be stopped well in advanced when checking blood sugar level	28 (43.8)	26 (40.6)	10 (15.6)	44 (45.4)	39 (40.2)	14 (14.4)	28 (57.1)	17 (34.7)	4 (8.2)	0.579

Statistically significant values have been put in bold.

DA = Disagree, N= Neutral, A = Agree

DISCUSSION

It is evident that misconceptions in insulin therapy are lower than thought to be. Literacy did not have any effect as both the literate and illiterate perceived the misconceptions the same way. In this study, the mean duration of diabetes in patients was 9.05 years while the age range was 15 years till 98 years. A local study conducted in Rawalpindi showed 25.2% of their participants having DM for greater than 10 years while the majority were under 5 years.¹⁹ A similar study in India showed 9.4 ± 7.6 years as the mean duration of diabetes mellitus.²⁰

In terms of perception towards insulin therapy, the question of insulin as a cure towards diabetes was answered in disagreement by majority of the illiterate, undergraduate and postgraduate participants (82.8%, 77.3% and 87.8% respectively). However, in similar studies conducted throughout the world, many believed that DM can be cured with insulin.²⁰

Majority of participants in this studied disagreed to insulin being a source of social embarrassment or a cause of weight gain. Similar findings were present in a study published by Yilmaz UD, et al, that while people disagree that it affects their weight or social life, it is a source of demoralization for an individual.³

In a study conducted by Nakar et al, there was fear of addiction amongst patients that were not on insulin therapy.²¹ Diabetics in the present study did not think that insulin was addictive because insulin is an essential substance the body needs, it cannot lead to addiction.²³

A study conducted by Choudhury et al stated that people were aware that diet and exercise is important for maintaining blood sugar levels.²² Similarly, in this study, 77.6% disagreed that diet restriction was not part of glycaemic control if insulin is taken. This may be because people are becoming more health conscious

due to the increased incidence of diseases due to sedentary lifestyles.

In a study conducted by Arshad I, et al, it was found that variables such as embarrassment of injecting insulin in public (54 and 114 males and females respectively), insulin being expensive (69 and 127 males and females respectively) were perceived to be high while belief that insulin use has a negative effect on health (101 and 148 males and females respectively) were perceived to be low.²⁴

In the present study a similar picture was seen with one exception. A clear majority believed price of insulin was high (53.3%) but injecting insulin in public was not considered an embarrassment (77.6%). Participants understood being misled that insulin injection would give them a contagious disease (76.6%) or weight gain (64.1%).

Generally, participants were well aware of insulin therapy and did not have many misconceptions. This may be due to the increasing incidence of diabetes mellitus with people acquiring more information regarding the disease and its prevention. Regarding level of education, the knowledge gap between illiterate, undergraduates, and graduates was found to be negligible, perhaps because patients visiting this tertiary care hospital belong to a relatively well aware and elite class.

CONCLUSION

Diabetic patients included in the study were well informed about insulin therapy with only a few misconceptions.

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